



The Present and Future Outer Continental Shelf

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The Minerals Management Service (MMS) is the federal authority designated by the Department of the Interior to manage mineral resource development on the 1.76 billion acres of offshore federal lands. As the federal oceans mineral land manager, MMS has worked diligently for 20 years to create a framework for Outer Continental Shelf (OCS) mineral resource development, whose primary characteristics are predictable schedules and timely review of proposed actions, combined with a flexible and transparent approach.

MMS believes that a sound and fiscally responsible regulatory system will attract capital and expertise to fully develop and produce resources in an environmentally sound and safe manner.

The exploitation of offshore mineral resources is largely focused on producing oil and natural gas for the U.S. economy. This has been the case for the 50 years since passage of the Outer Continental Shelf Lands Act.

Over the last decade, MMS has been witness to a changing vision of offshore activity, stimulated by a technologically driven venture into the deep ocean, the beginning of a return to the old stomping grounds of the shallow water shelf and a growth in the global nature of the offshore oil and gas industry.

Recent Scientific Research

Over the past decade, MMS has made available various economic incentives to stimulate production of offshore oil and gas in deep water (about 1,000 feet and deeper) and, more recently, deep shelf gas (below 15,000 feet subsea). Industry has responded by developing the technology and practices required to tap these resources. For instance, synthetic moorings and composites have made it

possible for larger floating facilities to operate under the extreme environmental forces involved. However, as industry gets closer to producing in water as deep as 10,000 feet, economic factors concerning the weight of steel and water handling issues may slow this ever-progressive march into the ultra-deep. The offshore industry and MMS are working to address some of these challenges through joint research projects and the development of codes and standards needed to continue an outstanding safety and pollution prevention record.

With a royalty incentive now in place to stimulate drilling deeper into the continental shelf's new frontier to develop natural gas resources, industry has responded with a number of new wells. This effort will rely heavily on the sustainable and continued use of existing facilities, including both structures and pipelines. However, the production of this deep gas creates some technical challenges that industry and regulators must address.

Drilling deeper into the geological strata (below 15,000 feet) results in higher temperature and pressure, and higher flow rates during production. The results are increased stress while drilling and producing with effects which must be evaluated for new facilities and re-evaluated for existing facilities. For pipelines, higher temperatures deplete cathodic protection anodes more rapidly and induce additional loads that may affect ultimate integrity. This creates a large safety, inspection and maintenance challenge for operators, and an increased monitoring workload for the MMS to observe whether industry is following recommended practices and whether the facility's design level is adequate.

As MMS faces technological challenges, it continues to seek a better understanding of the offshore envi-

ronment. MMS recently completed a field study to obtain observations describing the vertical structure of the marine boundary layer over the western and central Gulf of Mexico. Field observations for upper air wind and temperature, surface wind, surface temperature, surface relative humidity, surface pressure and sea surface temperature were collected at two offshore platform sites during a 40-month period. The data will be used to evaluate land/sea breeze effects on the marine boundary layer, assess air-sea interaction in the gulf and reduce uncertainties in MMS air quality environmental assessments.

MMS is also currently funding a joint study with Mexico to measure deepwater currents outside the U.S. Exclusive Economic Zone of the Gulf of Mexico. This study will allow the MMS to obtain current measurements in Mexican waters that will complement measurements obtained from other ongoing MMS studies. The objective of this study is to resolve the water column flow structure in this deepwater area about 200 miles from the U.S. coast that will serve as the southern boundary for other ongoing MMS studies. Exciting new energy discoveries in the ultra-deepwater of the gulf over the past year increased the importance of this work. Six discoveries in water depths greater than 5,000 feet indicate the advance to another energy frontier.

In addition, MMS has initiated a partnership with the National Oceanic and Atmospheric Administration (NOAA) through the National Ocean Partnership Program to commission a study of the biological/archaeological significance of deepwater shipwrecks in the Gulf of Mexico.

This important study will benefit NOAA's ocean exploration program while providing information for MMS's regulatory program with regards to the reef effects of deepwater structures, deepwater ocean currents and historic preservation of World War II-era shipwrecks. This is truly a multidisciplinary research effort.

The benefits of MMS's research efforts may have use in other regions of the world where there is similar activity. Since 1994, MMS has participated in the International Regulators Forum (IRF). The IRF is a group of regulatory agencies from around the

world with responsibilities for the safety of offshore oil and gas facilities. Members include the United States, Brazil, England, Norway, Canada, the Netherlands, Australia and New Zealand. These countries share information on technological advances, safety issues, accident investigations, regulatory policies, international standards and conventions, performance measurement and research. Forum members also cooperate in the development of standards and establish reciprocal agreements for the exchange of personnel.

Recent efforts such as the 2003 International Offshore Pipeline Workshop and studies such as the "Safe Design of Hot On-Bottom Pipelines and Integration of Human Factors within Safety Assessment and Management" have enjoyed sponsorship by MMS and other U.S. federal agencies, international regulators, and major oil and gas companies. These projects will provide information that can be used in many offshore areas, lead to new research projects, update codes and standards, define critical offshore technology needs for both traditional and frontier areas, and provide critical feedback and background knowledge for the United States and international policymakers.

Conclusions

MMS recognizes that appropriate mineral development on the OCS entails a number of factors—economic viability, accurate assessment of resource availability, development of key technologies, understanding of the offshore and coastal environment, and an open and collaborative administrative process. MMS applies a unique knowledge base to view offshore industrial development in its entirety, built on 50 years of information to evaluate modern day offshore exploration and its 20 years of experience in developing a regulatory regime for oil and gas activity.

This experience, coupled with recent interest in offshore resource uses by those outside of the traditional oil and gas industry, has allowed MMS to form some observations about the future: the use of the ocean has evolved from a state/federal concern to a regional and sometimes global concern where businesses that have operations on the U.S. OCS are likely

to have similar and/or different types of operations on other parts of the OCS or overseas; and there is an increased potential for both multiple and collaborative use of OCS lands for commercial development, such as a recent interest in the OCS for wind and wave energy.

From this conclusion, it is necessary to increase cooperation among state and federal entities for the wise use of America's oceans. /st/

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